APPLIED PLANT RESEARCH

# Good Agricultural Practice in Organic Farming

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# Personal introduction

- Wijnand Sukkel
- Organic Agronomist

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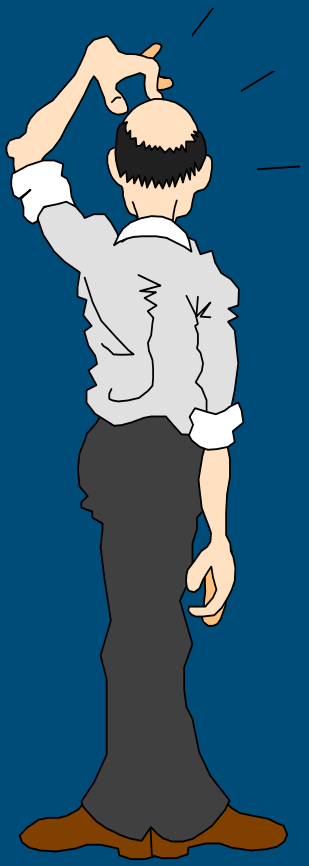
# Elements for succesfull organic production

- Farm
- Knowledge
- Craftmenship
- Entrepeneurship
- Market



# Do not start with this

# Toolsbox: farming methods

- Crop rotation
- Soil cultivation
- Crop protection
- Weed control
- Fertilisation/Nutrient management
- Ecological infrastructure management

# Emphasis in farming methods

*conventional* *organic*

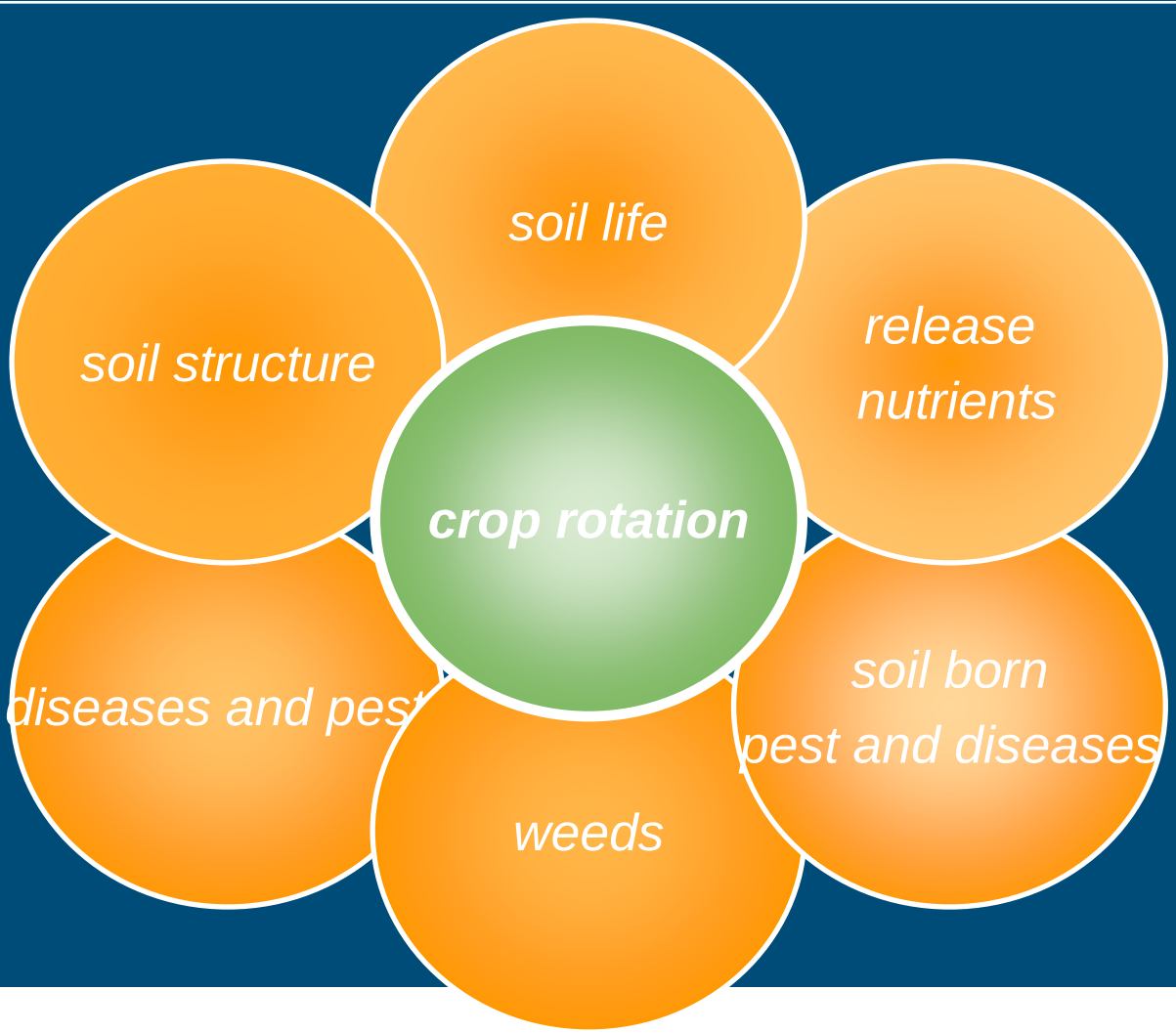
**soil structure**
- crop rotation
- organic manure
- green manure
- soil cultivation

**nutrient supply**
- crop rotation
- organic manure
- green manure
- mineral fertiliser

**weeds**
- crop rotation
- cropping system
- mech. control
- pesticides

**pests and diseases**
- crop rotation
- cropping system/ resistant varieties
- pesticides

# Influence crop rotation



# Crop rotation

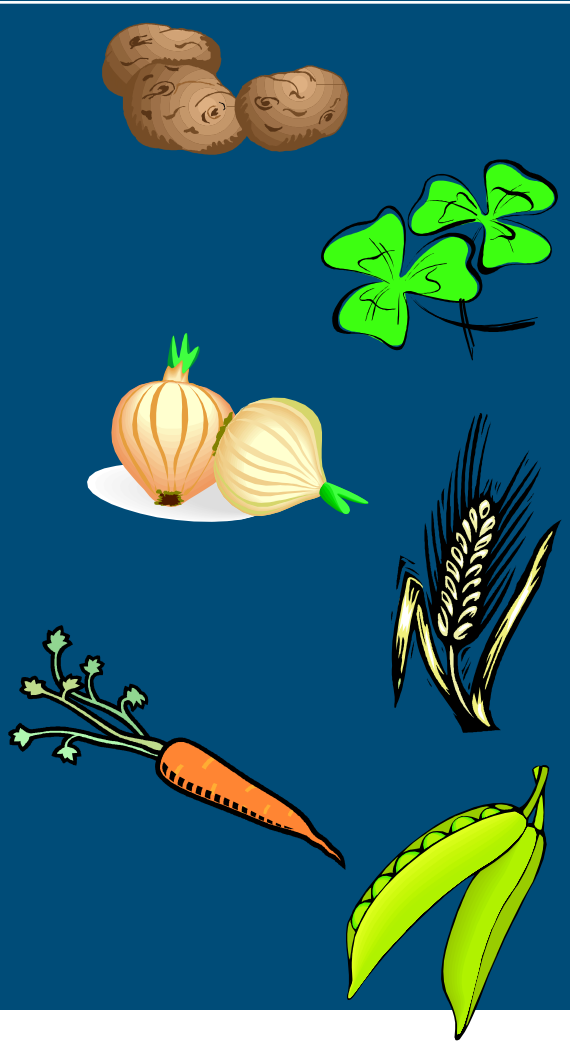
- Crop choice (team of players)
- Crop frequency
- Crop sequence
- Spatial layout

# Balanced Crop choice

- High and low nutrient demand
- Nitrogen fixating crops
- Intensive and superficial rooting
- High and low weed suppression
- High and low labour demand
- Different species and families

# Crop Rotation Example

1. Potatoes
2. Grass/clover
3. Onions
4. Springwheat
5. Carrots
6. Peas



# Crop frequency, general recommendations

effective for crop specific soil born pests and diseases

- 1 in 6 for species
- 1 in 3 for families

- Take also green manures into account

# Crop sequence

- Soil structure
- Pests and Diseases
- Weed control

# Crop Rotation Example

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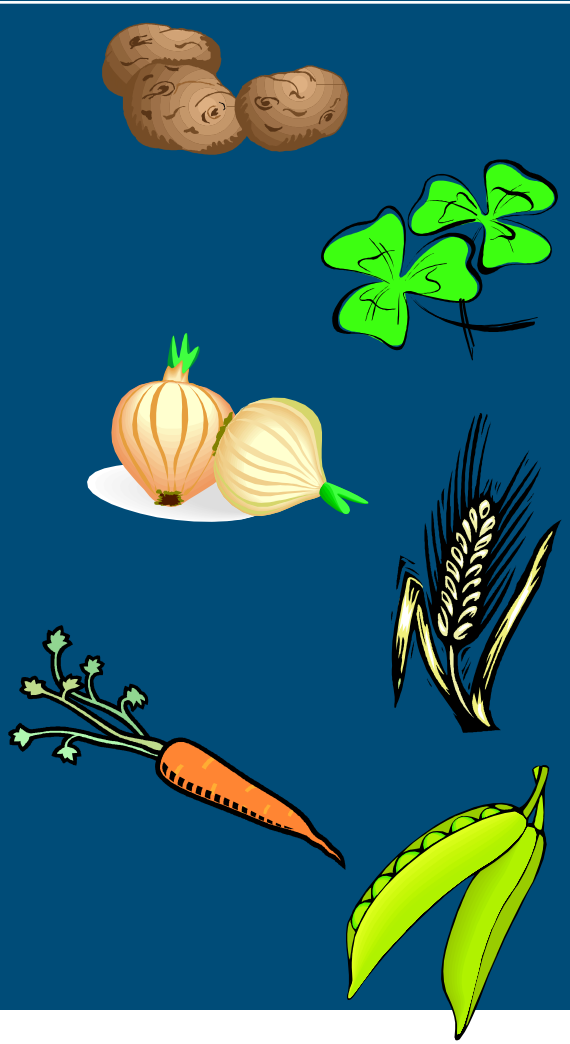
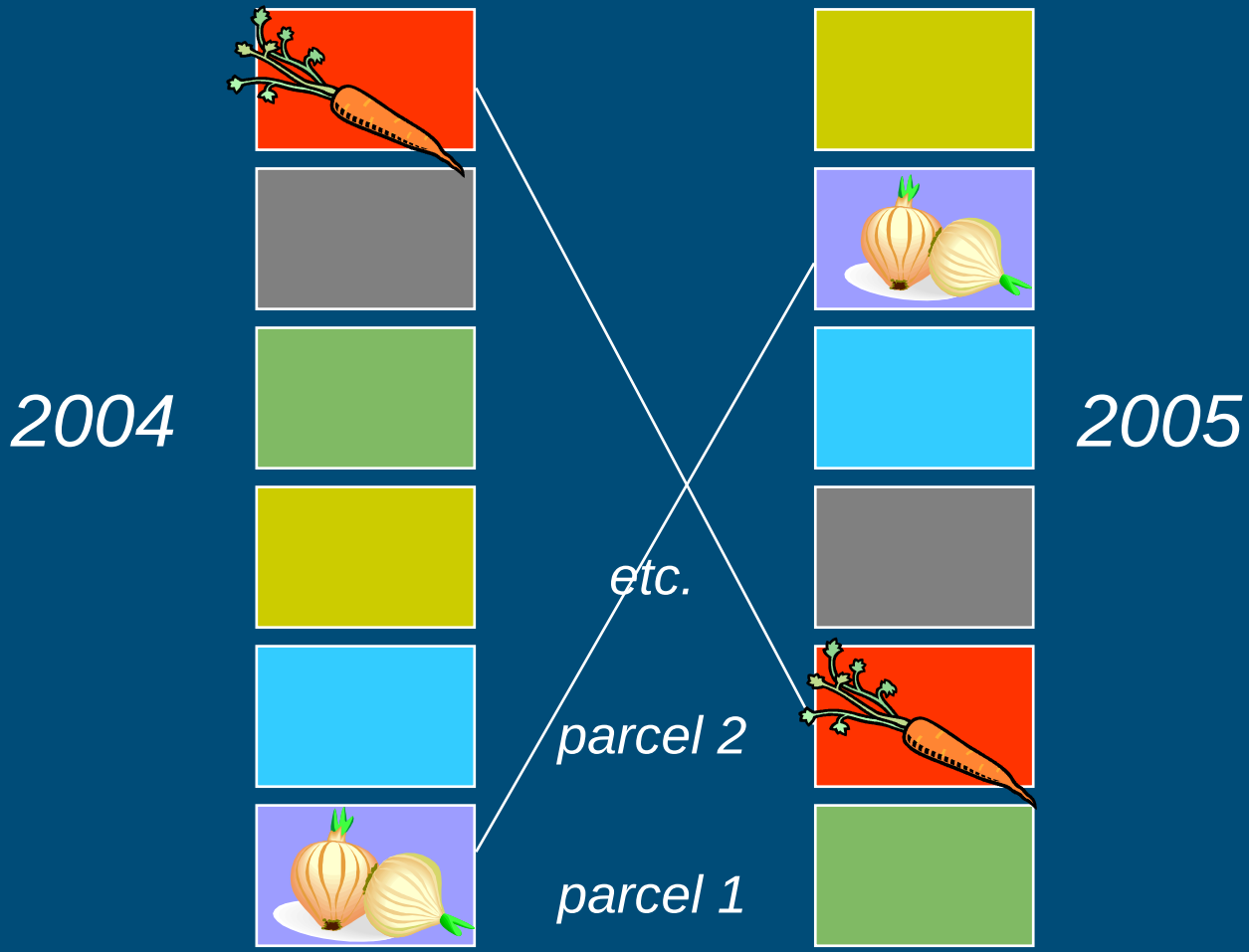


# Spatial crop rotation



# Nutrient management

Inputs: manure, compost, Nitrogen fixation!

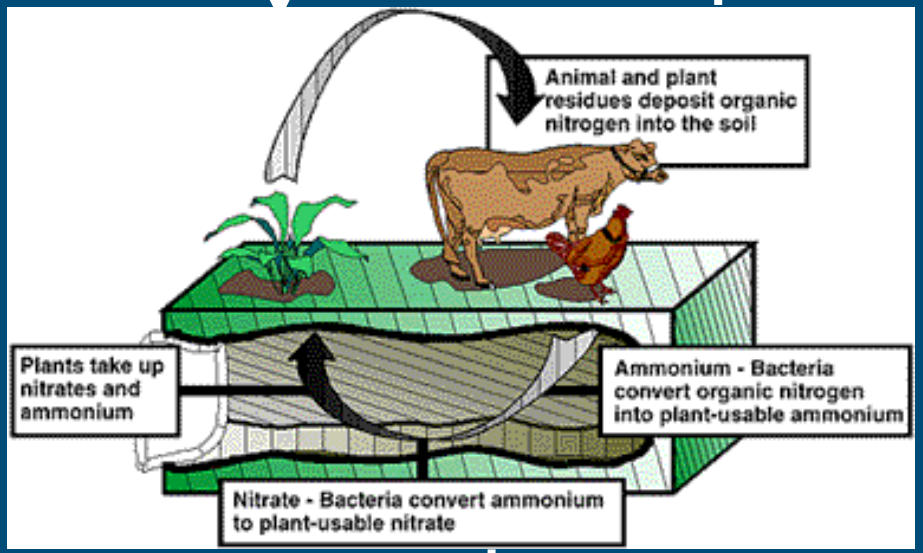
- Inputs of Phosphorus and Potassium sources are allowed!

Losses (Nitrogen): Storage, Application, Leaching

# Nitrogen cycle

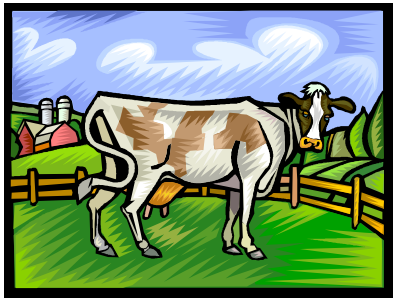
Fixation, deposition

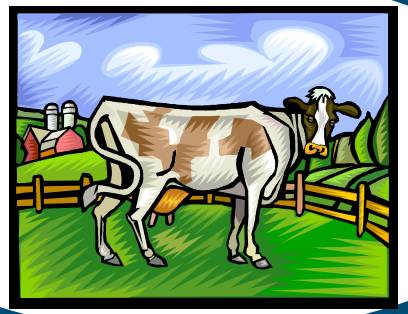
Gas emissions




leaching

# Mixed farm or seperate?



# Avoid losses and use Nitrogen fixation

- Manure storage
- Manure application
- Carefull composting
- Catch crops, green manure

- Leguminous crops in rotation, clover, alfa alfa etc

# Control of pests and diseases

Prevention is crucial !!!

There are very few effective measures once you have a problem!!

# Prevention, strategic

- Crop rotation
- Farm hygiene
- Clean seeds
- Variety choice
- Soil structure
- Farm lay out
- Ecological infrastructure

# Prevention, operational

- Timing of sowing
- Row distance
- Crop cover
- Fertilisation
- Irrigation

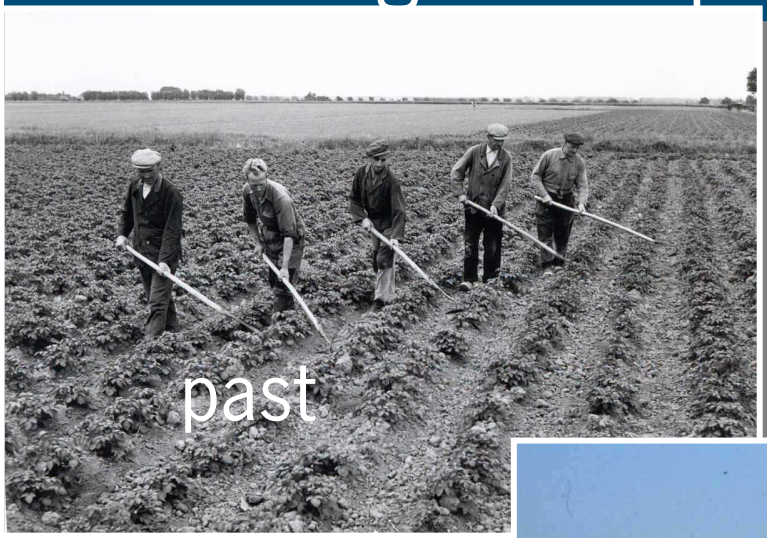
# Control measures

- Non-chemical control (mechanical, biological)
- Chemical (bio-toxins),
  - bio pesticide selection
  - application technique, timing

# Weed control

- Again pevention!!
- Mechanical control
  - Harrow
  - Hoe
  - .....
- Timing is crucial

# Weeding techniques in organic farming

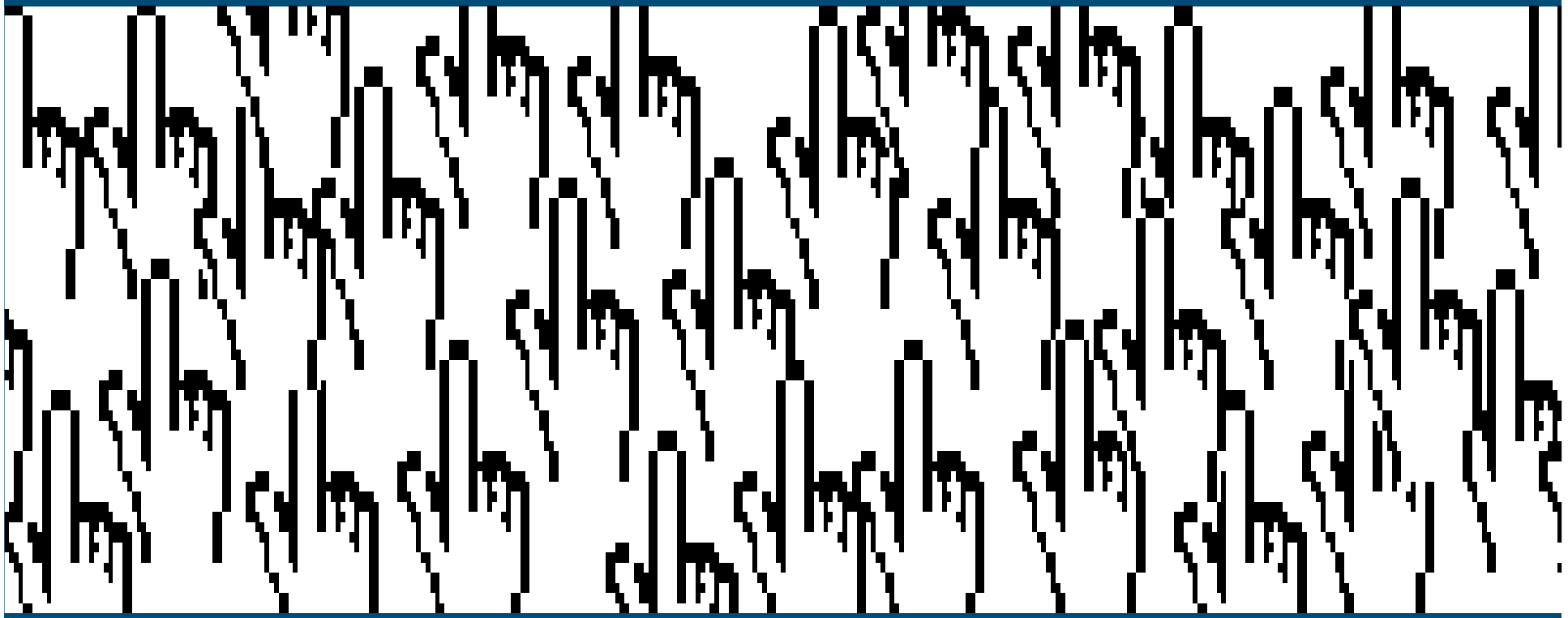


past


Nowaday's Mechanisation

But Weeding still needs handlabour

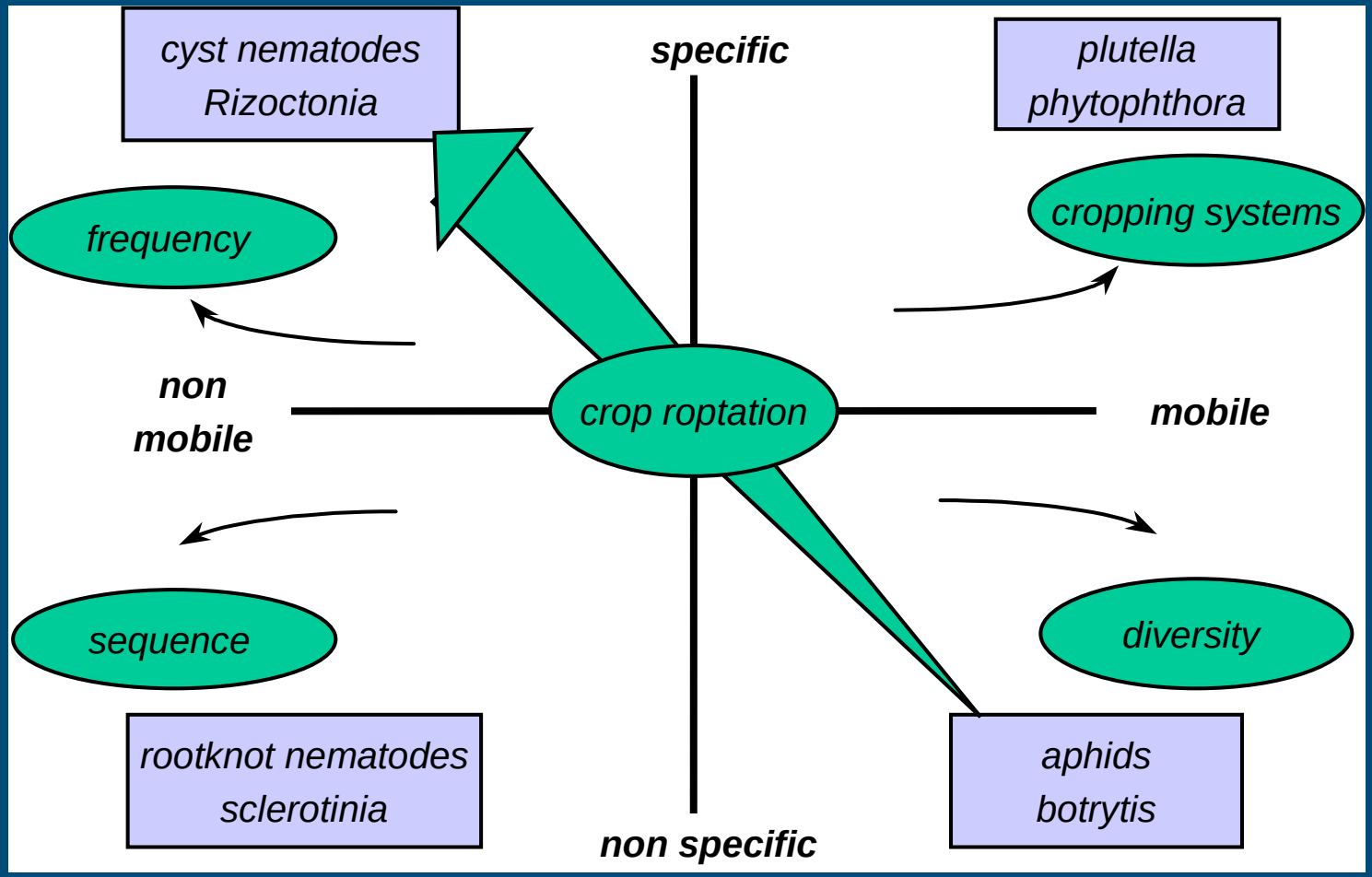
# Questions?



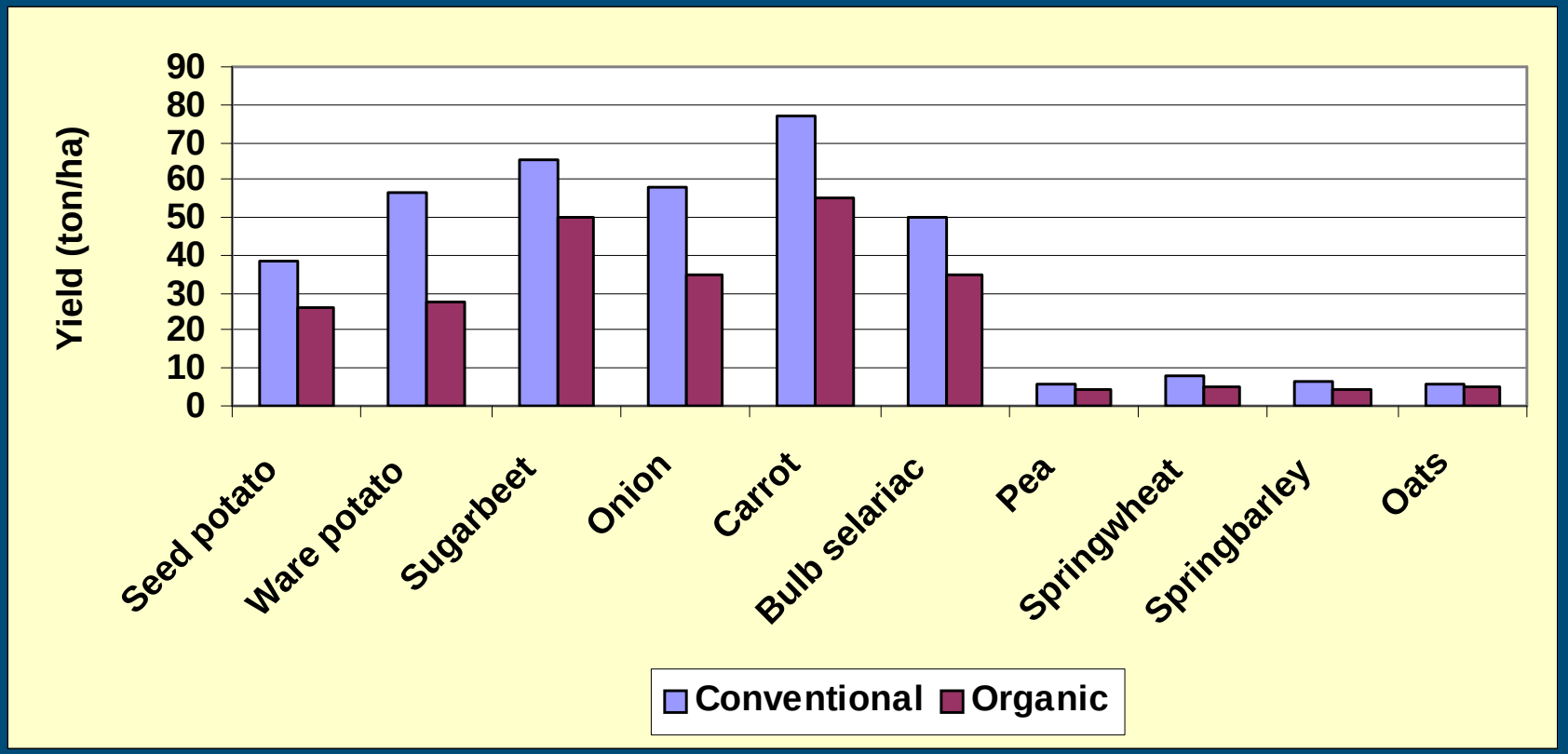
# Multifunctional Crop Rotation (MCR)

- basis for
  - soil fertility
  - healthy and vital crops
- optimise positive and minimise negative interaction
  - pest and diseases,
  - nutrient recovery etc.
- well balanced team of players
  - sequence and frequence

# Crop Rotation, prevention of pests and diseases

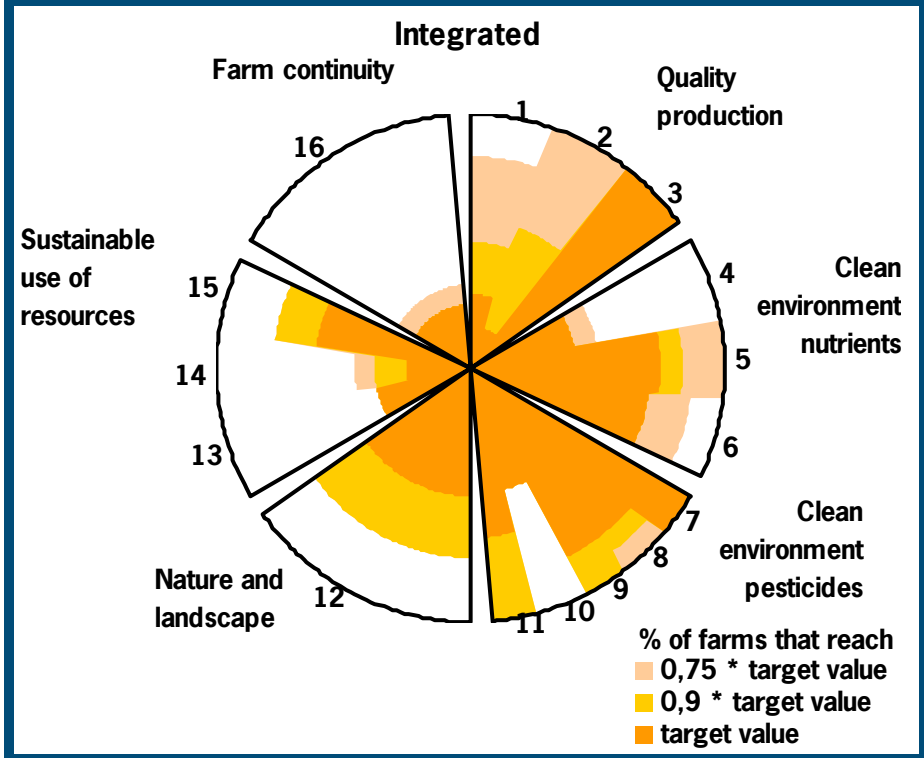


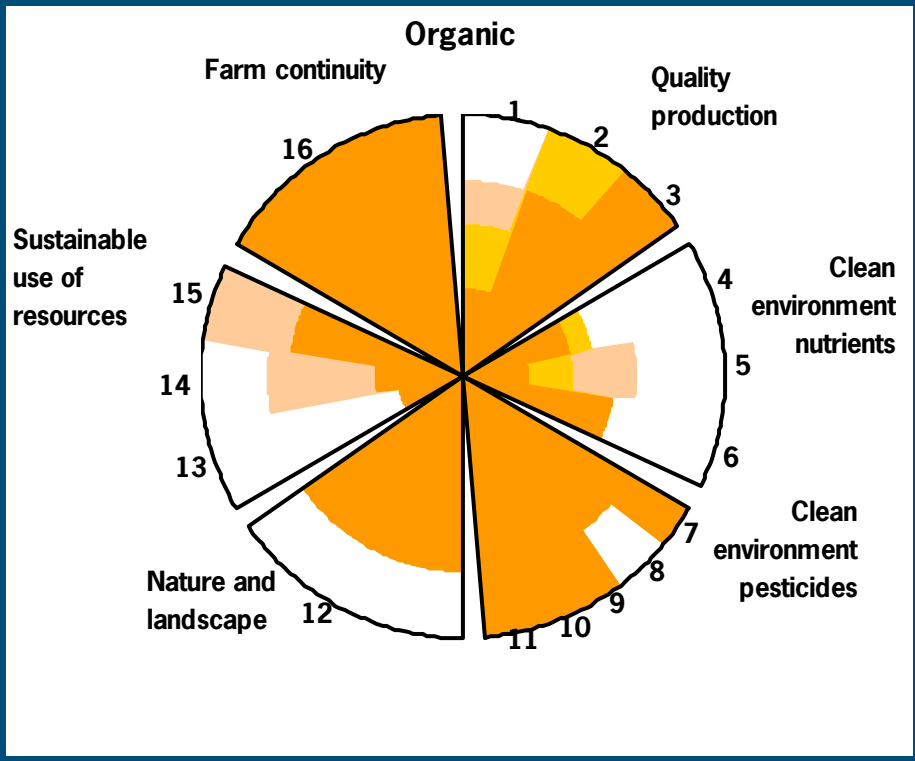
# Comparison yield organic-conventional



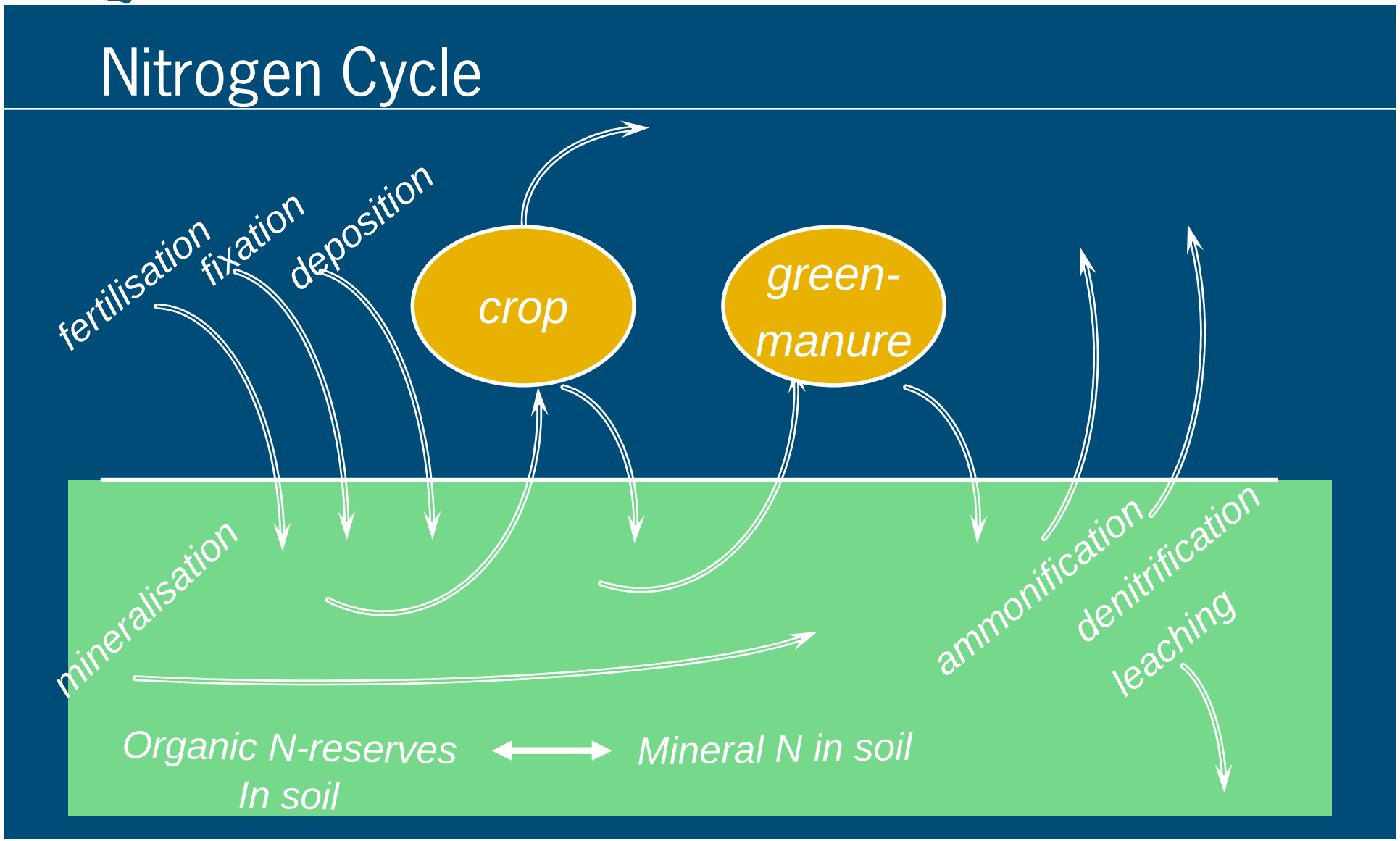
# Comparison between integrated and organic systems

## EU project Vegineco 1997-2002 (experimental farms)

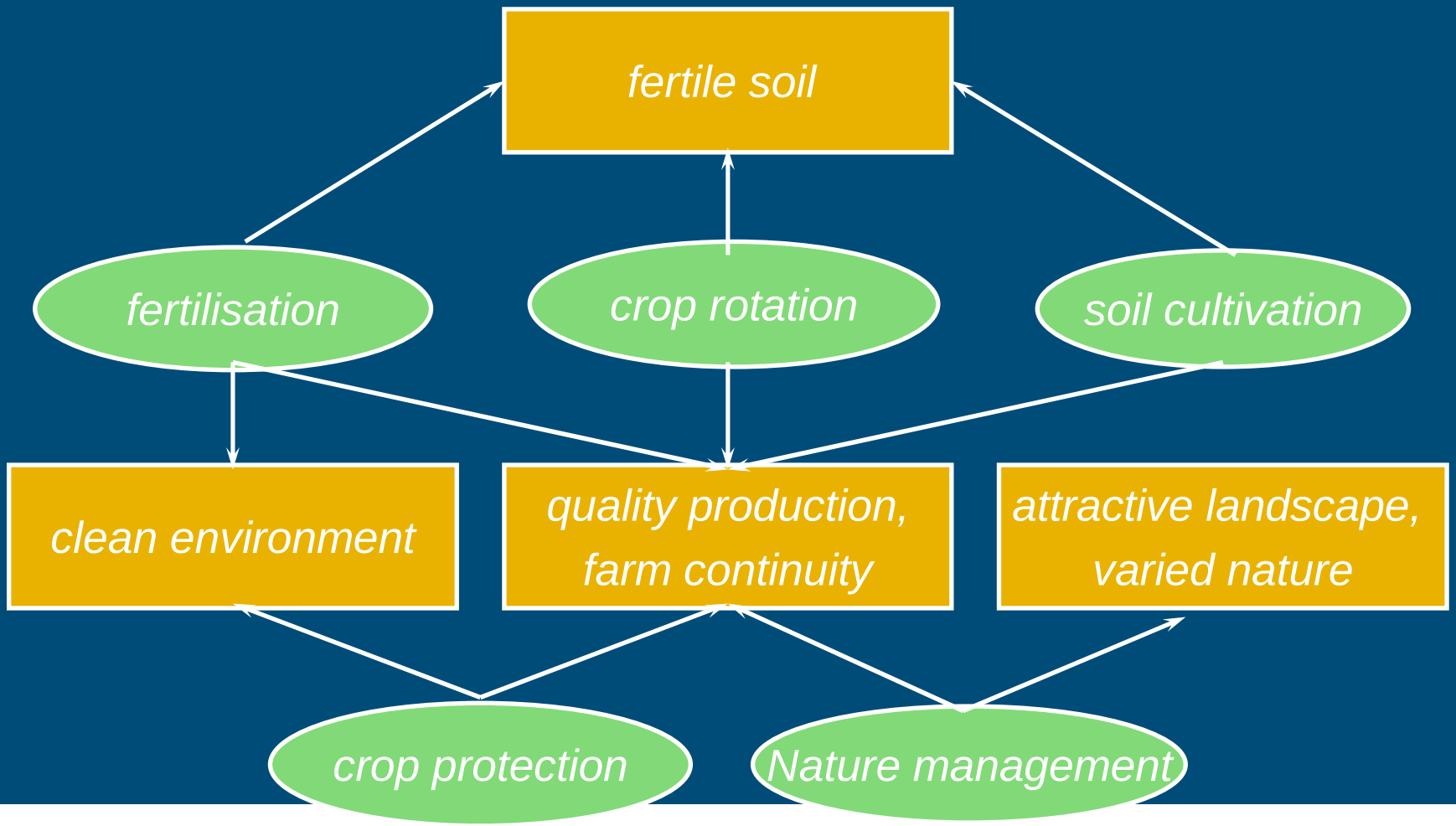


# Nitrogen Cycle



# Farming practices and intentions



# Rotation, green manures and fertilisation (org)

| | Crop | Green manure | Animal Manure |
|---|---|---|---|
| 1. | seed potato | grass-clover | 22 ton solid goat manure |
| 2. | grass-clover | grass-clover | 30 $m^3$ leak water |
| 3. | sown onions/sugar beet | white mustard / - | 30 ton solid goat manure |
| 4. | spring wheat | Persian clover | 12 ton solid goat manure |
| 5. | winter carrot / chicory | - / - | - |
| 6. | processing peas | Italian ryegrass | - |